Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Project, Process and Technology Management
Course code	47540
Scientific sector	ING-IND/17, ING-IND/35
Degree	Master
Semester	1
Year	1
Academic Year	2025-2026
Credits	10
Modular	Yes

Total lecturing hours	28+28
Total lab hours	
Total exercise hours	18+18
Attendance	Recommended
Prerequisites	None
Course page	https://www.unibz.it/en/faculties/engineering/master-industrial-mechanical-engineering/course-offering/?academicYear=2025

Specific educational objectives	The course is one of the basics of the scientific area of Industrial Engineering. The course gives a general overview of the main scientific contents. During the course, the presented theoretical topics will be integrated through targeted application-oriented exercises and through a real game-based business simulation. The learning objectives of module 1 are to introduce engineering students in the fundamentals of project management. Specifically, it will deal with the subjects of project planning, project scheduling and project monitoring. The learning objectives of module 2 are to introduce students to the fundamentals of process and technology management. In particular, the part that concerns the process management will deal with process identification, modelling and redesign and the part that concerns the technology management will deal with technology foresight and related methods.

Module 1	Project Management
Lecturer	Prof. Patrick Dallasega
Scientific sector of the lecturer	ING-IND/17
Teaching language	English
Office hours	See on timetable

Teaching assistant (if any)	tbd
Office hours	See on timetable
List of topics covered	**1. Introduction to Project Management** **2. Project planning** a) The Work Breakdown Structure (WBS) b) The Organizational Breakdown Structure (OBS) c) Planning of resources **3. Project scheduling methods** a) Network diagram techniques (AOA, AON) b) The Critical Path Method (CPM) c) The Program Evaluation Review Technique (PERT) d) Project Crashing e) Resource allocation **4. Project progress measurement and forecast** a) Progress measurement b) The Earned Value Analysis (EVA) c) The Earned Value Performance Measurement (EVPM) **5. Project risk management** a) Methodologies for project risk identification b) Methodologies for project risk evaluation **6. Construction Project Management** a) The Last Planner System (LPS) b) The Location Based Management System (LBMS) **7. Exercises** a) Exercises on AOA, AON b) Exercises on CPM, PERT, project crashing, resource allocation c) Exercises on EVA d) Exercises using Microsoft Project e) Last Planner Simulation game f) Excursion to local companies to provide practical illustrations of project management processes
Teaching format	Frontal lectures and exercises in class (laptops are required for some lectures and exercises)

Module 2	Process and Technology Management
Lecturer	Prof. Guido Orzes
Scientific sector of the lecturer	ING-IND/35
Teaching language	English
Office hours	By email appointment
Teaching assistant *(if any)*	tbd
Office hours	-
List of topics covered	**1. Process management** a) Introduction to business process management b) Process identification and description

	c) Process modelling (Business Process Model and Notation - BPMN) d) Process discovery e) Process analysis f) Process redesign Exercises: • Exercises on process modelling using the BPMN software BIZAGI • Case study (process modelling and redesign) **2. Technology management** a) Introduction to technology management b) Technology management activities: acquisition, exploitation, identification, protection, selection c) Technology management tools: portfolio management, patent analysis, value analysis, stage-gate, S-curve, technology roadmapping Exercises on technology management
Teaching format	Frontal lectures and exercises in class (laptops are required for some exercises)

Learning outcomes	**Intended Learning Outcomes (ILO)** **Module 1** <u>Knowledge and understanding</u> 1. The students know the basic and most common methodologies of Project Management (Planning, Scheduling and Monitoring) and the main used tools. 2. The students are able to understand the issues relating to the development, implementation and management of production and logistics systems; <u>Applying knowledge and understanding</u> 3. Students will be able to apply theoretical concepts of planning, organizing and managing projects. 4. By means of exercises performed in the computer laboratory, the student will be able to use software tools like Microsoft Project, which is one of the most used tools of local companies. <u>Making judgements</u> 5. The students are able to interpret Key Performance Indicators of project management to understand if projects are over, under or on budget and time.

Communication skills

6. Ability to structure and prepare a presentation describing project management concepts with business language

Ability to learn

7. Ability to autonomously extend the knowledge acquired during the study course in different industrial contexts

Module 2

Knowledge and understanding

8. The students will understand the issues related to the process identification, modelling and redesign and will know the basic and most common methods used in process management
9. The students will know various methods used for the technology management and foresight
10. The students will understand how firms can rely on external collaboration to innovate

Applying knowledge and understanding

11. Students will be able to apply theoretical concepts of process management and to use BPMN tools for the process description and modelling
12. Students will learn how to apply theoretical models of technology foresight and to implement complex technology foresight methods like T-start and scenario planning

Making judgments

13. Students will be able to transfer the knowledge and methods learned to real practical applications
14. Students will be able to describe processes in a way that allows to find their criticalities and to redesign them
15. Students will be able to recognize consciously the technological positioning of a company and to find options for its development and improvement, using technology foresight

Communication skills

	16. Students will be able to present process analyses and technology roadmaps 17. Students will be able to interact in a competent and professional way in complex, multi-participants workshops like the ones used in T-plan and scenario planning methods <u>Ability to learn</u> 18. Students will be able to autonomously extend the knowledge acquired during the study course by reading and understanding

Assessment

Module1

Form	Length /duration	ILOs assessed
Written exam	1,5 hours	1,2,3,4,5
Presentation case study	15 minutes per student group	5,6,7

Module 2

Form	Length /duration	ILOs assessed
Written exam	1,5 hours	8-18
Case study (modelling and re-design)	BPMN models + 1 page report	8, 11, 13, 18

Assessment language

English

Evaluation criteria and criteria for awarding marks

Project Management – Module 1:
The grade is calculated from the results of the written exam and the case study (exercise part). The theoretical part counts 50% and the exercise part counts 50% of the final grade.

Process and Technology Management – Module 2:
The grade is based on a written exam with exercises and theoretical questions and on a case study (on process modelling and re-design). The written exam counts 80%, and the case study (modelling and re-design) 20% of the final grade.
The assessment is based on ability to solve exercises about the topics of the course (process mapping and re-organization and technology roadmapping), clarity of answers, mastery of language (also with respect to teaching language), ability to summarize and establish relationships between topics.
Final grade:
Average of Module 1 and Module 2.

Required readings

Lecture notes and documents for exercises will be

	available on Microsoft Teams, Reserve Collections and the Open Learning Environment (OLE).
Supplementary readings	**Module 1** • "Project Management for Construction" by Hendrickson http://www.ce.cmu.edu/pmbook/ • Meredith, J. and Mantel, S., (2000) "Project Management: A managerial Approach", J. Wiley & Sons New York • De Marco, A. (2011). "Project Management for Facility Constructions", Springer Science & Business Media. • Cantamessa, M., Cobos, E., Rafele, C., (2007) "Il Project Management – Un approccio sistemico alla gestione dei progetti", ISEDI De Agostini. • Pmi lexicon pm terms PMI.org • Project Management: A Systems Approach to Planning, Scheduling, and Controlling 11th Edition by Harold R. Kerzner (Author) • Project Management – Competency Development Framework • www.iso.org ISO21500:2013 – ISO21502-5 • www.pmi.org Project Management standard - PMBOK® GUIDE V Edition • http://www.ipma-usa.org/ IPMA_ICB_4_0_WEB **Module 2** Process management • Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2018), 2nd edition. "Fundamentals of business process management", Berlin: Springer. • Modeler user guide of BIZAGI, available at: http://help.bizagi.com/process-modeler/en/ Technology management • Cetindamar, D., Phaal, R., & Probert, D. (2016). "Technology management: activities and tools". Macmillan International Higher Education. • Phaal, R., Farrukh, C., & Probert, D. (2010). T-Plan: "The fast-start to technology roadmapping: Planning your route to success". University of Cambridge, Institute for Manufacturing.